Patent 5,498,260 to Rink, and in further view of Volume 23, pages 1226-1228 of optics letters to Matsuura. The rejections are respectfully traversed.

None of the references, whether considered alone or in combination, disclose or suggest a method for processing a cell, comprising irradiating a living cell or a living tissue with a laser beam through a hollow optical fiber filled with an inert gas; and cutting off, removing or boring a cell wall or a cell membrane or an entirety of the cell wall thus irradiated; wherein the cell is irradiated with the laser through reflection and condensing which are effected through a chip of quartz glass.

The primary reference of Abela discloses a laser catheter 14 having an optical fiber element 38 to apply laser energy 18 to porate cells (see Fig. 1; col. 1, lines 25-28 and col. 4, line 49 – col. 5, line 13). In the Office Action, the primary reference of Abela is admitted as not disclosing irradiating the laser through a chip of quartz glass or using a hollow waveguide filled with an inert gas, as recited in claim 1.

To overcome the admitted deficiency, the Office Action combines Henriksen. However, the Office Action admits that Henriksen does not teach use of quartz glass for condensing and reflecting a laser, or to use a hollow waveguide filled with an inert gas, as recited in claim 1. Rather, the Office Action indicates that Henriksen discloses a nitrogen laser having a wavelength within the range recited in claim 2.

The Office Action also combines Beeh as allegedly teaching the use of quartz to condense a laser in the UV range because quartz and fluoride are the best material operating in this wavelength range. The Office Action specifically cites col. 3, line 64 – col. 4, line 9 of Beeh.

Beeh relates to a means for projecting high resolution images onto silicon wafers coated with a photoresist material, or to any material requiring photographic etching in utilizing a photosensitive emulsion, such as in the manufacture of micro-circuits. Thus, as the

subject matter of the rejected claims pertains to a method for processing a cell, the applied reference of Beeh relating to projecting high resolution images into silicon wafers is sufficiently non-analogous that one skilled in the art would not look to Beeh as alleged in the Office Action.

Additionally, the subject matter of this application and the applied reference of Beeh are addressing problems so different from one another, that there can be no suggestion or motivation in either of the references, or in the general knowledge of those of skill in the art, to make such a combination. For example, the subject matter of this application addresses problems pertaining to conventional methods for processing living bodies, and for enabling fine processing for the introduction of foreign matter into a specific cite or cell of a living tissue having a complicated three-dimensional shape (see paragraph 0005 of the specification). In contrast, Beeh is addressing problems in the fundamental limitations of direct contact printing, such as those recited in col. 1, lines 52-66 of Beeh.

Furthermore, Beeh fails to disclose the features at col. 3, line 64 – col. 4, line 9 as alleged in the Office Action. For example, the Office Action alleges that Beeh teaches using quartz to condense a laser. However, the referenced section of Beeh describes only achieving a desired resolution using certain lenses. The cited section also describes the amount of energy available in the ultraviolet range and the detrimental effect that the amount of energy has on exposure of the photographic plate during processing.

In col. 1, Beeh discloses a Xenon mercury flash lamp 1 which emits light through a band pass filter 2. The high intensity beam is passed through a quartz condenser lens 4 before being received on a photo plate 6 having a photo emulsion 5. Although Beeh does disclose a condenser lens 4 made of quartz, the selection of the quartz material is based on the spectral response of the light passing through the quartz which happens to be in a sensitivity region of the photoresist emulsion layer 5. In other words, the light passing through the lens is of a

type to expose or develop the emulsion 5 on the photo plate 6. Accordingly, Beeh fails to disclose a cell being irradiated with a laser through reflection and condensing which are effected through a chip of quartz glass.

Fig. 3 of Beeh discloses an argon laser 12 passing through a semi transparent mirror 16 and lens 15 before passing through a light valve 14. However, as clearly disclosed in Fig. 3, there is no quartz condenser lens being used in the process nor is the lens 15 identified as a quartz condensing, reflecting lens. Thus, there is no teaching of the use of a quartz condenser lens to reflect and condense a laser as alleged in the Office Action. Finally, Beeh also fails to disclose or suggest a hollow optical fiber filled with an inert gas.

The Office Action goes on to further combine Rink for allegedly teaching the use of quartz at the tip of a laser and coating the quartz with gold to reflect the laser energy.

Rink fails to disclose the use of quartz to reflect and condense a laser, or the use of a hollow optical fiber filled with an inert gas.

Rink does disclose the use of quartz in the fibers of laser devices that are used to transmit laser radiation. However, Rink discloses the use of plastic or silicon cladding to protect the quartz fiber (col. 2, lines 28-30). Rink also discloses problems with such quartz fibers and therefore teaches away from the use of quartz in such optical fibers (col. 4, lines 3 and 4).

Rink relates to preventing the overheating and failure of a firing tip in an optical laser delivery device (col. 4, lines 54-59). Rink discloses one solution to prevent the overheating of a firing tip as providing a transparent, hard, heat resistant tip, such as sapphire or quartz (col. 3, lines 3-5). Thus, Rink only discloses that the use of quartz as being hard and heat resistant will prevent overheating of a firing tip. Thus, Rink fails to disclose or suggest reflecting and condensing a laser irradiating a cell through the use of a chip of quartz glass. Thus, there is no suggestion in Rink to make the combination as proposed nor, were the

combination made, would such a combination disclose or suggest each and every feature of the rejected claim.

The Office Action also alleges that Rink discloses the subject matter recited in claim 5, i.e., a surface of the quartz glass chip being coated with a metal. Although Rink discloses the use of quartz to prevent the overheating of a firing tip of a laser delivery device, Rink fails to disclose the quartz being coated with any metal. Rather, Rink discloses an alternative to the use of quartz is to provide a highly reflective surface in the scalpel tip for deflecting the beam. A reflecting coating is deposited or otherwise applied to the transmitting end or firing tip of an optical fiber waveguide such that the beam of radiation is internally reflected out one side of the transmitting end of the waveguide. Thus, rather than disclosing coating the quartz chip with the metal, Rink discloses an alternative to the use of quartz as coating the fiber waveguide with metal. Accordingly, Rink also fails to disclose the features of claim 5 as alleged in the Office Action. Finally, Rink fails to disclose the use of an inert gas in a hollow optical fiber.

The Office Action goes on to combine the newly applied reference of Matsuura to overcome the deficiencies of the previously cited and discussed references. Matsuura relates to a method for vapor deposition of aluminum on an inner wall of optical fibers (Abstract of Matsuura). However, Matsuura is silent regarding the use of a chip of quartz glass to reflect and condense the laser which is irradiated in a cell, and thus fails to overcome the deficiencies of any of the above-discussed references. Accordingly, as none of the references, whether considered alone or in combination, disclose or suggest each and every feature recited in the claims, withdrawal of the rejection of claims 1, 2, 5-10, 13 and 14 under 35 U.S.C. §103(a) is respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1, 2, 5-10, 13 and 14 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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